



Rating your home's performance

HOW "GREEN" IS YOUR HOME? As green building practices become increasingly mainstream, we're hearing more and more: "That's a green remodel," or "The home was designed to be sustainable." But what do these labels mean, and how much stock should we take in the claim?

Often, specific elements of green building are evaluated, such as:

- Energy and water efficiency beyond code
- Indoor air quality
- Rates of construction or demolition recycling
- Percent of materials with environmental attributes (e.g., recycled content, locally produced, from sustainable harvest sources, etc.)

If we take the time to gather the information on these and other yardsticks of sustainability, we can begin to gather an overall view of a home's environmental performance. And, if we use standard methods for gathering this information, we can actually begin to compare homes—a key element in developing a strong market for green buildings. Luckily, several green building rating systems are beginning to address this need.

Locally, the Master Builders Association of King and Snohomish Counties developed the Built Green™ program [<builtgreen.net>](http://builtgreen.net) to assist builders with creating green homes, and help consumers identify them. Built Green consists of a series of over 200 action items meant to promote the use of green products, protect water quality, ensure a healthy indoor environment, and save energy and water.

The more actions a builder adopts, the higher the point value for the project, and, by inference, the better the environmental profile of the home. When a home is Built Green certified, its level of achievement (one through five stars) helps the current or prospective homeowner compare one home to another in terms of environmental performance. Built Green has the added benefit of offering

a Remodel version of its checklist. Homes earning one through three stars are given a simplified certification process that relies on a signed letter from the builder affirming the checked items on the list were indeed done. Four- and five-star homes must hire an independent auditor to confirm the home's performance.

At the national level, the US Green Building Council [<usgbc.org>](http://usgbc.org) is developing its LEED™ (Leadership in Energy and Environmental Design) suite of tools. The USGBC is a nonprofit organization with the mission of transforming the building marketplace toward more environmentally responsible designs and practices.

LEED is a menu-based rating system which describes specific actions the design team or builder can take (e.g., creating a building that's a specific percentage better than code requirements in terms of energy use, or installing a rainwater harvest system). LEED was initially developed for commercial buildings, but a new residential version (LEED Home, or LEED-H) is being piloted throughout

the country. Currently, this program is focused on new construction. All homes undergoing LEED certification must have an independent rater verify the builder's actions.

Rating systems help buyers gauge the overall performance of a home.

There are also programs which focus on a particular subset of green building, such as the Energy Star Homes program [<northwestenergystar.com>](http://northwestenergystar.com), specializing in energy efficiency. Energy Star Homes can be used by itself; it's also a mandatory part of LEED-H and can also be coupled with the Built Green program (in fact, Energy Star performance is required for 4th and 5th star levels of the Built Green program).

Given the complexity of a building project, such green building tools will become increasingly useful for verifying claims. Learning about the existing systems will help demystify what it means for your home to be green, and help you identify strategies you or your designer or builder may not come up with by yourselves. So start exploring!

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Events & educational opportunities

Wed. 12/7, 7-9:00 P.M.: RESIDENTIAL EARTHQUAKE RETROFIT. Learn the basics of retrofitting your home to minimize earthquake damage. Foundation improvements, hardware installation, wall strengthening and other strategies will be covered.

Where: At the Phinney Neighborhood Center.

Cost: \$15 for PNA members, \$20 for non-members.

Details: <phinneycenter.org> or 206/783-2244.

Wed. 12/7, 7-9:00 P.M.: VISIONS OF UTOPIA: EXPERIMENTS IN SUSTAINABLE CULTURE. Part of the Environmental Film Nights sponsored by the Northwest Environmental Education Council, this film explores the stories of real people taking active steps to improve their communities and the world.

Where: Seward Park Environmental Learning Center

Cost: Free!

Details: <www.nweec.org/ea.htm>

Web site of the month:

Treehugger.com

Looking for a clearinghouse of the latest and hippest in green design, products, and lifestyle in general? Then check out <treehugger.com>. The site bills itself as “the largest, most frequented green lifestyle site on the net.” The site is organic in more ways than one. It relies on postings from interested individuals around the world who scour the Web for green products, stories, and ideas. The aesthetic bent tends toward the modern, but just about every style is represented in some form.

Those interested in green building: select “architecture” from the drop-down menu, and find hundreds synopses of stories and links to source information. Whether it’s a story on the first LEED (Leadership in Energy and Environmental Design, a green building rating system) certified winery or the development of a paint that cleans itself by mimicking the surface of a lotus leaf, each story has something to tell, and provides lots of inspiration.

The constant addition of stories and links confers a freshness to the site that others lack, and in a field like green design where things are changing daily, it helps the user stay abreast of the latest developments. And don’t limit yourself to the architecture section: find thousands of postings on everything from clothing to transportation—even a “cool but ugly” section. Check it out—you may be calling yourself a tree hugger soon!

Green home Q&A

Q: *Our carpet is overdue for replacement. What are some environmentally friendly options?*

—Karen S.

A: Carpet is kind on the feet, but can also be a challenge when it comes to environmental and health issues. Conventional broadloom (wall-to-wall) carpet is generally made from synthetic fibers, meaning it’s non-renewable. Additionally, it’s a complex mix of materials and adhesives, making it difficult to recycle. And in the United States, virtually all carpet production is centered in the South, meaning we’re far away from the manufacturers—increasing the energy and pollution resulting from transporting it to our Seattle homes.

On the health front, carpet is also problematic. Whether it’s natural or synthetic fiber, a carpet acts as a “sink” for toxins and irritants brought in from the yard and street, as well as pesticides and lead-contaminated dust from indoors. Moreover, many synthetic carpets tend to “off-gas” for some time after they’re installed, releasing compounds into indoor air. Healthy house experts generally recommend dispensing with carpet whenever possible and utilizing hard surfaces such as tile, concrete, wood, cork, or linoleum. If your existing carpet is concealing a wood floor, consider removing the carpet and refinishing the existing floor.

If you’re still yearning for something soft underfoot, there are greener carpet options. Strategically placed rugs made from natural fibers such as wool, jute, or sisal can help soften a hard floor. These same fibers are available for wall-to-wall applications as well. Additionally, innovative applications of carpet, such as the Interface FLOR® product are an eco-friendly alternative. FLOR is the residential version of a commercial flooring invention, the carpet square. Carpet squares are more materials-efficient than broadloom carpet, as only the soiled or worn elements need to be replaced. Interface also offers a recycling program, helping consumers close the loop.

When installing carpet, be sure to request the material be unrolled and allowed to air out in the warehouse for at least 48 hours prior to installation. This will help reduce the amount of volatile compounds entering your home. Additionally, request that the carpet be tacked down, rather than glued. This helps protect indoor air as well.

Have a green remodeling question of your own? Let us do the research for you! Email questions to: <greenhome@seattle.gov>

CASE STUDY: Magnolia Remodel

ARCHITECT: Grace Huang, ming |
architecture and design

CONTRACTOR: Jon Alexander, Sunshine
Construction

LANDSCAPE ARCHITECT: Linnea Ferrell

STRUCTURAL ENGINEER: Swenson Say
Faget

GEOTECH ENGINEER: Glen Mann, Creative
Engineering Options

INTERIOR DESIGNER: Robin Wille,
Wille Inc.



Photo: Jon Alexander

A two-kilowatt solar array creates electricity on site, reducing the need for grid-supplied power.



Added roofing insulation and high-efficiency windows further reduce heating energy needs.



Photo: Jon Alexander

Exterior sun shades above windows and sliding doors minimize unwanted heat gain.

Remodeling fever can sometimes run roughshod over financial, personal and environmental concerns on a project. Keeping one's wits can be difficult in the face of so much opportunity for change, but the alternative (a project vastly over budget and out of line with actual needs) can lead to remodel remorse. This project attempted to avoid unnecessary expense, and to respect the context of the neighborhood, which is at risk of losing character as smaller houses are increasingly replaced by larger ones. Additionally, the site is classified as a Critical Area due to its steep slope. Given these priorities and the site's classification, scope limitation became a primary guiding principle.

"The owner wanted to do the right thing," says Grace Huang, architect with **ming | architecture and design**. The objective of keeping the home's footprint unchanged was established early in the process as a guidepost for the scope limitation goal. Also, use of salvaged materials was given priority.

Respecting history.

On the exterior, changes were intentionally kept to a minimum. The deck size was kept the same, and brick elements were rebuilt in their preexisting configuration. Along with improvements to the entryway, the main change to the exterior environment was the addition of a 960 gallon rainwater harvest cistern, and the creation of a water feature and private garden outside the Master Bedroom, replacing a concrete slab patio.

The original house dates from the 1940s, and the structure experienced various additions and modifications over time. This created another goal: blending the division between the original structure and current and historical remodels, creating a unified whole. Purchasing salvaged oak flooring of similar vintage to the existing flooring and mixing the two together was one strategy that helped achieve this goal. Other salvaged and reused materials include lumber, doors, wood trim and cabinetry, hardware, plumbing and electrical fixtures, landscape plants and brick.

In the kitchen, existing casework was retained, and only cabinet door and drawer faces were replaced. The replacement elements are a combination of plywood and locally grown Forest Stewardship Council (FSC) alder wood frames. FSC certification ensures the wood is coming from well-managed forests in accordance with strict rules and independent verification of claims. Learn more about FSC and sustainable forestry at certifiedwood.org. (Throughout the project, FSC certified lumber and portions of interior wood trim were used.) The kitchen flooring is natural linoleum, a mix of linseed oil, wood flour, and pigments. Its non-petroleum origins and durability give it an environmental edge over many other flooring options. Energy Star appliances, durable paper-and-resin countertops, a range hood vented to the outdoors, and fresh air intake round out the kitchen's green features.

Resource efficiency.

The existing vaulted ceiling in the living room received a layer of rigid insulation, increasing the insulating value in that section of the home to R-30 (R-38 in some areas). In other areas of the home with attic space, recycled cellulose insulation increased insulating value to R-45. Structural reinforcements were also made to the roof, to compensate for preexisting deficiencies. Recycled-content cellulose insulation also increases the thermal performance of the home's exterior walls. In all, the home energy efficiency was increased to be in line with Energy Star Homes standards.

To save resources and protect indoor and Puget Sound air quality, the home's wood-burning fireplaces were converted to gas. The oil forced air furnace was replaced with a high-efficiency gas unit utilizing hydronic and forced air and hydronic baseboard heat. Hydronic heating utilizes hot water rather than heated air to warm spaces, and is generally a more efficient heating method than forced air.

Windows were upgraded to triple-pane fiberglass units with a "u-value" of .23. U value is a measure of heat loss through a window assembly, and the lower the number the more efficient the unit. Seattle residential building code requires a u-value of .40, so the windows used are almost twice as efficient as code requirements. A programmable thermostat keeps the home comfortable 24/7 while saving energy. Rough calculations of the performance of the building's "envelope" (building components that face the exterior) predict a vast improvement over prior performance—a prediction expected to be borne out in reduced utility bills down the road.

The interior modifications maximize daylight and air circulation. Many window and door openings remain the same, while solar tubes in the upstairs hallway and bath pour natural light into previously dark spaces that relied exclusively on electric light. Lighting design with an eye for energy efficiency reduces the remaining electrical load related to lighting.

Energy-efficient appliances, water heater, and water-efficient fixtures such as "dual-flush" toilets (featuring half- and full-flush options) are also on the list of the home's efficiency features. Blower door testing, a process that determines how well sealed a home is from air infiltration, was conducted to ensure the home was constructed to specifications. "Duct blaster" tests on the heating system's ductwork helped ensure quality assembly of that system as well.

Making more of existing space.

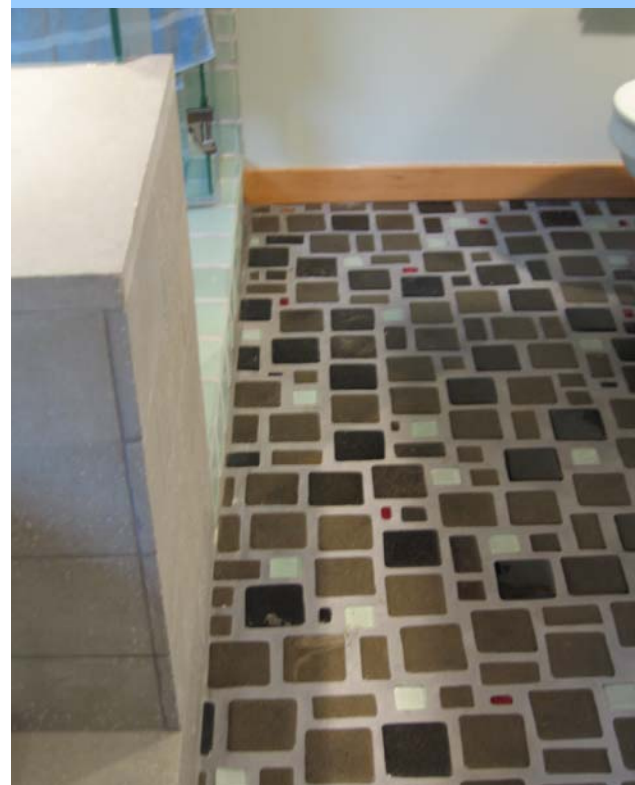
An oddly-sized room between hallway and Master Bedroom was turned into a library, housing books, papers, and the owner's music collection. The cabinetry in this room is FSC certified maple. The cabinetmakers, although new to the use of sustainable harvest wood, were very much on board and eager to share knowledge, paving the way for success on the future projects.

The Master Bath contains the most visible (and luxurious) green elements. These include a tub surround of Squak Mountain Stone, a locally produced cement-based material featuring recycled content. This finish material is coupled with Blazestone tiles from Bedrock Industries, a Seattle company whose products are 100% recycled glass. Earth-toned tiles cover the floor in an artfully random pattern, with tiles of ice blue and crimson punctuating the subtle browns. The shower tiles also feature similar patterning in a single color. The existing cabinetry was retained, updated with new door fronts and topped with Squak Mountain Stone.

Collaboration between the client, the project team, consultants, subcontractors and materials/product suppliers was key to the success of the project. The result of this collaborative spirit is a respectful remodel that honors the home's history and context while adding a high-performance green element to the list of good design features.



Locally produced, recycled-content "Squak Mountain Stone" surrounds the tub.



Recycled glass tile from Bedrock Industries forms a colorful mosaic underfoot and in the shower.

For further information on this project:

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Sustainable Building Program